

Extracorporeal septoplasty—how we do it at marienhospital stuttgart germany

Wolfgang Gubisch · Vikas Sinha

Abstract Septoplasty is one of the most common surgery of ENT but even today the difficult septum still presents a great surgical problem. A severe septum deformity is usually due to an accident quite often in childhood. It is also seen in patients with malformation such as cleft lip and cleft palate deformity. It affects not only the nasal function, but also the aesthetic part of the nose. Severe septal deformities can not be corrected properly by the standard septoplasty techniques. Therefore in such cases an extracorporeal septoplasty is recommended. In this technique the whole septum is taken out, the bony and cartilaginous septum in one piece if possible, a new septal plate is reconstructed by different surgical techniques, followed by replantation and reconstruction of the cartilaginous dorsum. The first author kept on improving the safe septal fixation, rebuilding of cartilaginous dorsum and overall the extracorporeal septoplasty technique over the period of time and this technique with all its refinement can be recommended to all the surgeons dealing with this challenging noses.

This is an invited article.

W. Gubisch¹ · V. Sinha²

¹Prof. and Head of the clinic,
Department of Facial Plastic Surgery,
Marienhospital,
Stuttgart, Germany

²Fellow Rhinoplasty
Department of Facial Plastic Surgery,
Marienhospital,
Stuttgart, Germany
Professor and Head E.N.T.,
B.J.Medical College (Civil Hospital),
Ahmedabad, India

W. Gubisch (✉)
e-mail: plg@vinzenz.de

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Introduction

The septum has an influence not only to the function of the nose but it also affects the external shape of the nose. Quite often the deviation of the external nose persists even after performing S.M.R. or septoplasty. Some years ago, a German health insurance company surveyed the results of the most common ENT procedure, the septoplasty, and the follow-up showed that after surgery around 50% of patients faced the same problem as before and sometimes they had even worsened. So there is big discrepancy between the opinion that septoplasty is an easy operation and the dis-satisfying results with relatively high failure and complication rate. The influence of the septum on the outer shape of the nose is often neglected. On the other hand the exact straightening of the septum is prerequisite for an adequate correction of deviated axis of the nose. The severe deformities of the septum can not be corrected properly by classical standard techniques of septoplasty. Perret and King in 1952 and Ashley in 1958 suggested taking out the septum and replant the straight one. The first author followed this idea and technique in early 1980, took out the whole septum in early 1980 to reconstruct a straight neoseptum and kept on improving this technique in last 27 years and performed this operation during this time in 2554 cases.

Problems

‘As the septum goes, so goes the nose’ said Irving Goldman. The severely deformed septum is quite often associated with external deviation of nose. Most often it is the childhood trauma which was not treated at that time and may cause this problem. Many a times cartilage is fractured and healed in a dislocated manner and causes bending

and deviation of septum over the period of time (Fig. 1). Sometimes it is the rupture of the cartilage which causes this problem. The patients of cleft lip and cleft palate deformity also have quite similar badly deviated septum (Fig. 1). Sometimes in badly deviated nose, the S.M.R. (sub mucous resection) does improve the breathing difficulty of the patient but external deviation of the nose remains as such. In all such cases even the classical septoplasty will not bring permanent straight septum. This can be achieved only by an extracorporeal septal reconstruction which may correct the external deviation of nose too.

Methods

All the cases were done in general anaesthesia. The patient was prepared and draped as in standard fashion of septoplasty. The nasal cavities were packed with saturated cotton pledgets of topical anaesthesia about 30 minutes prior to the surgery and ropivacaine hydrochloride (Naropin) and epinephrine in 1:100,000 was infiltrated to external nose and nasal septum about 15 to 20 minutes prior to the surgery. All the cases of extracorporeal septoplasty since 1997 were done with open approach. A standard inverted V- columellar incision was designed which was extended to marginal incision and dissection of membranous septum was planned to expose the anterior edge of the cartilaginous septum. The surgery started with dissection of the tip and only then the columella was cut. Perichondrium and periosteum were elevated from the nasal septum first on the concave side to minimise the risk of tearing of mucosa followed by the similar dissection on the opposite side. To make the dissection easier in severe cases, the first author did extramucosal dissection, that means dissected the mucosa from the junction between upper lateral cartilage and septum. If dorsal hump removal was necessary at this point, the dissection of the mucosa was done from a cranial approach which was safer and more comfortable. If dorsal hump reduction was not done at this stage, the upper lateral cartilages were incised bilaterally from the septum after the extramucosal dissection. This made the nasal septum more flexible and made the mucosal dissection more easy

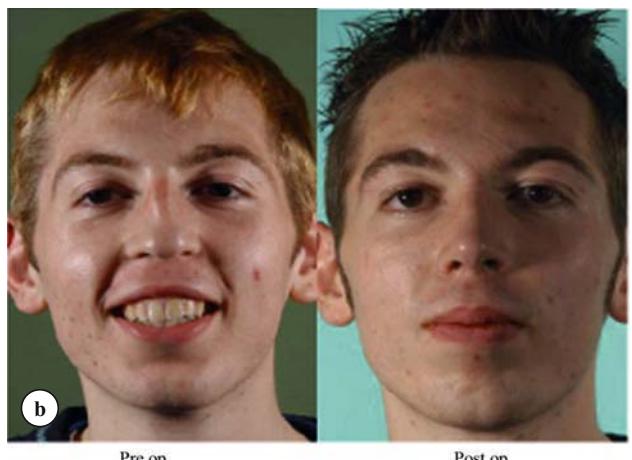
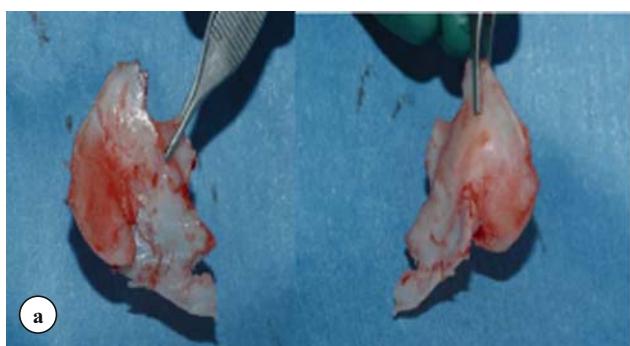


Fig. 1 (a, b, c, d) Showing badly deviated septum and patients of cleft lip and cleft palate deformity pre and post operation.

and precise. The anterior nasal spine and the premaxilla were brought into the midline and if necessary fixed by osteosynthesis (micro plates). After total dissection, the bony septum was fractured as far as possible posterior by the pressure of a 5 mm. chisel. If hump reduction was not done, a para median osteotomy was done to separate the bony septum from the dorsum. The first author did this step with motor drill for last few years because it was more precise and enabled to remove the bony triangle of the septum from the most cranial point of the junction of the nasal bone exactly. Afterwards the complete cartilage and bony septum was removed in one single piece. Then started the careful analysis how to create a straight septal plate or even a septal framework which needs usually the dimensions of 30 mm. in horizontal and 18–20 mm. in vertical extension. Often the resected septum had to be turned and shaped in different manner. This removed septal plate was made straight by several ways, either unilaterally reducing the tension of the cartilage by giving partial thickness releasing incision on the concave side of the bent cartilage (scoring). A sharp drill could also smoothen the cartilage and bone. After drilling of cartilage if cartilage became straight but weak and soft and appeared to be unstable, the perpendicular plate of ethmoid bone was thinned out and sutured onto the side of the cartilage after making small holes in the bone with the drill. A cartilaginous spreader graft was sutured to the upper border of septum to stabilise and reinforce it (Fig. 2), this procedure also opened up the internal nasal valve angle. In post traumatic cases where there were multiple fracture sites and these sites healed in dislocation, the straight pieces were dissected out and sutured together to make a straight septum. Even Polydioxone foil (PDS) was used as a template for suturing and creating neoseptum. In post operative cases or in saddle deformities where there was very little cartilage left the bony septal plate may be smoothened, straightened and thinned. Then on this septal plate multiple holes were made by drill. The holes were made to secure the fixation by transseptal sutures and also for the ingrowth of the tissue which made the septal plate more stable. The straighten new septum was planted between mucosal layers of the septum. It was very important to have a stable fixation for its long term success, aesthetically and functionally. The replanted septum was first positioned with the needles to the upper lateral cartilages and afterwards fixed permanently by plac-

ing horizontal U shaped sutures. Only then the septum was adapted in height and fixed to the anterior spine. Therefore a hole was drilled through the nasal spine and septum was firmly anchored with multiple sutures. To camouflage post operative dorsal irregularities, onlay fascia grafts were placed on the dorsum. The skin flap then was repositioned and sutured with 6-0 nylon threads.

The nasal mucosa was approximated by horizontal mattress sutures from caudal to cranial and back. These sutures prevented dead space formations and provided further stabilisation of the newly replanted septum. Silicone foils were sutured on either side of the septum as splinting and finally nasal cavity was packed with foam tamponade soaked in antibiotic solution of neomycin and bacitracin. The POP cast was applied to the nose and forehead and was fixed by a circular bandage around the forehead.

Discussion

Although the classical septoplasty technique itself has undergone several modifications, it was very difficult to reach a permanent straight septum in severely deviated septum. The external axis of the nose was never corrected. The external deviation of the nose remained unchanged. Kings and Ashley in 1952 and Perret in 1958 first started the concept of removing and replanting septum. The concept of extracorporeal septoplasty was started by the first author in 1981. It was a radical removal of the whole septum, to straighten it and replant it. It was due to radical surgery so it was reserved only for the severe deformities of the septum. Initially a closed approach technique was used but the safe reconstruction of the dorsum was a problem with this technique. Around 8 % of the patients complained of dorsal irregularities and required further correction. Since 1996 first author started using the open approach technique. Furthermore homologous fascia lata was used from the upper thigh to camouflage the dorsal irregularities. The fascia lata of upper thigh has very good parallel structure of collagen fibre which is ideal for camouflaging the dorsal irregularities. Even autogenous fascia graft was used but it created additional incision and additional time to harvest it and additional postoperative care. Tutoptast fascial graft is an alternative and avoids all these problems but creates additional costs. Motor powered sharp fraise was used to shave off the deviated and thickened portion of the septum (cartilage and bone) before replanting it back. If cartilage became weak and unstable during its shaving, the perpendicular plate of the bone was used as additional support of the cartilage as cartilage bone sandwich transplant. The PDS foil could also be used as alternative. Spreader graft was used in almost all the cases. They were sutured at the upper part of the straighten septum (Fig. 2) and the whole complex was sutured to upper lateral cartilages for reconstruction of the cartilaginous dorsum. This step also opened up the internal



Fig. 2 Showing cartilaginous spreader graft sutured to the upper border of septum

nasal valve angle. The new septum was secured properly to the nasal spine. Therefore a small hole was drilled through the nasal spine and the neoseptum was fixed with multiple sutures to prevent the chance of its slippage. Earlier first author fixed the neoseptum to the fibrous tissue around the spine but had slipping rate of septum around 6 %, after adapting the drill hole technique and fixing the septum with threads, the slipping rate reduced drastically. Ropivacaine hydrochloride and epinephrine (1:100,000) was used in all the cases to get very clear operative field as ropivacaine is the only local anaesthetic with vasoconstrictive property and its effects last much longer than those of epinephrine.

Conclusion

The technique of extracorporeal septoplasty which appeared to be a difficult one initially can be recommended to all surgeons dealing with all types of badly deviated and difficult septum cases. To get long lasting good results an open approach is necessary for safe fixation and grafts to the dorsum either by cartilage or fascia avoid the visibility of irregularities.

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